

## The Mississippi River: Water Source for Minneapolis

The water source for the City of Minneapolis and the seven suburbs served by the Minneapolis Water Works is the Mississippi River. Most large cities use surface water for the community source. Surface water sources can provide more water volume than localized groundwater wells, and surface water is a renewable resource when compared to groundwater. Surface water quality, however, is variable—dependent on weather and other environmental conditions. For this reason, rigorous water treatment processes are required for surface water sources.

## Water Treatment: Changes are Coming

The water treatment process at the Water Works treatment plants has remained basically the same for decades. This is about to change, however. Within two years, residents will begin receiving water treated with a new process—ultrafiltration. This state-of-the-art water treatment uses membranes to remove viruses, bacteria, other micro-organisms, non-dissolved materials and larger dissolved molecules from the source water. The first phase of ultrafiltration will permit replacing the sand filtration plant at the Columbia Heights complex.

## Source Water Assessment

The Minneapolis Water Works has recently worked with the Minnesota Departments of Health (MDH) and Natural Resources to complete a Source Water Assessment of the Mississippi River. This document provides basic information about where drinking water comes from and the degree to which it may be impacted by potential sources of contamination. Information on source water assessments can be obtained at the MDH website: ([www.health.state.mn.us/divs/eh/water/swp/swa](http://www.health.state.mn.us/divs/eh/water/swp/swa)).

## Change Management: Managing Technology to Change the Way We do Business

In 1999, the Minneapolis Water Works (MWW) embarked upon a five-year Change Management Program. The MWW vision states that the utility will provide customers with quality water and cost effective services in a manner that protects the safety of employees and the environment. This program helped the MWW develop a more competitive organization and has resulted in these accomplishments:

- A competitive assessment compared the MWW to the most efficient public and private utilities in the world.
- The Association of Metropolitan Water Agencies awarded the MWW its Gold Award for Competitiveness Achievement.

This program has also resulted in benefits our customers can recognize. We have undertaken an ambitious program of water main rehabilitation that increases water quality and reduces problems related to red water. Rather than replace old water mains, which is expensive and causes service disruptions and extensive street work, these pipes are cleaned and then lined with epoxy or cement mortar which reduces or eliminates problems associated with mineral buildup.

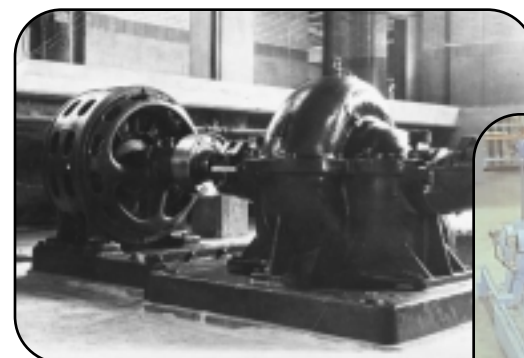
Energy costs are now held in check through a number of changes. The new computer system provides real-time energy use data that can be integrated with other system parameters like storage levels and intake volume. This enables Water Works staff to manage the system in the most energy-efficient way possible. MWW also has worked with our energy providers to maximize our energy use during the times of the day when rates are the lowest.

Maintenance is being scheduled by MWW's Proactive Maintenance Computer Management program. This enables staff to correct problems and breakdowns before they occur—usually at less cost and time spent.

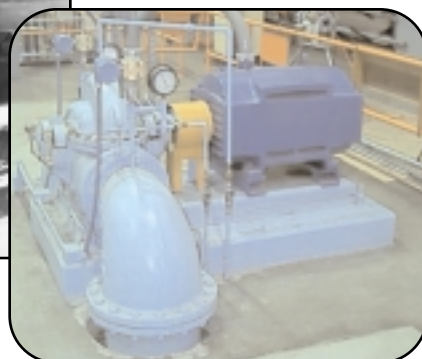
In summary, the MWW is using technology to change the way we do business, and the way we serve our customers.



*The days when water mains were constructed of concrete poured on site. Pipes like these now undergo rehabilitation rather than replacement.*



*Water Pumps—old and new.*



# Minneapolis Water Works

## Report to Water Customers for 2002

This annual water report is your opportunity to see how your water utility—The Minneapolis Water Works—is performing and how your drinking water compares to standards set by the U.S. Environmental Protection Agency (USEPA). It fulfills a requirement the City has to provide accurate and timely information about your drinking water and Minneapolis' water system.

This year's report describes how the Minneapolis Water Works has changed and continues to improve—and how improvements are being made to enhance water quality and service.

If you have questions about your tap water quality, or would like information on opportunities for public participation in decisions that affect water quality, please review our website at [www.ci.minneapolis.mn.us/citywork](http://www.ci.minneapolis.mn.us/citywork) or contact the water plant laboratory at 612-661-4999.

Informacion importante. Si no la entiende, haga que alguien se la traduzca ahora.

Noy yog ntaub tseem ceeb. Yog koy tsi to taub, nrhiav neeg pab txhais rau koh kom sai sai.

Arintan waa arin muhiim ah oo ka hadlaysa biyaha la cabo. Hadii aanad ingiriisiga akhrin karin waxaad raadisaa gof kuu macneeya.



**Minneapolis**

*City of Lakes*

**Department of Public Works**



*Water Treatment Plant workers—1920's and today*



*Water plant pump room—80 years ago and present day.*



*Water treatment plant under construction in 1917, plant today.*





Understanding the Laboratory Results

The **Level Found** can be the highest amount found in the water or the average of all samples analyzed, depending on the regulation. If multiple samples were tested in 2002, the lowest and highest detected values are listed under **Range of Detections**.

The highest level of a substance allowed in drinking water is the Maximum Contaminant Level (**MCL**), which is set by USEPA. Some contaminants also have MCL goals (**MCLGs**). This is the level of a substance where there is no known or expected health risk. MCLGs allow for a margin of safety. MCLs are set as close to MCLGs as feasible using the best available water treatment processes.

Unregulated substances do not have MCLs. They are assessed by comparing the detected amount to state standards known as health risk limits. If an unacceptable amount of any substance is ever found in our water, the Minneapolis Water Works will notify residents immediately and take corrective action to eliminate the problem. Monitoring for unregulated contaminants as required by USEPA rules was conducted in 2002. Results of this monitoring are available upon request from Pat McKasy, Minnesota Department of Health, at 651-215-0759.

The MCL for lead and copper is known as the Action Level (AL). This is the concentration which, if exceeded, triggers treatment or other requirement a water system must follow. Ninety percent of all samples tested must be below this concentration.

During 2002, USEPA began regulating disinfectant levels in water systems using a surface water source. The Maximum Residual Disinfectant Level (**MRDL**) is the highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants. The MRDL Goal (**MRDLG**) is the level of disinfectant where there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

**Turbidity** is a measure of water clarity monitored at the Minneapolis Water Works Treatment Plant. Certain treatment techniques (TT) are required to reduce the level in the drinking water. Regulations require turbidity to be <0.3 NTU 95% of the time and <1.0 NTU 100% of the time. Turbidity measurements during April of 2002 did fall below the 95% standard, resulting in a violation for the system. This problem was quickly corrected at the treatment plant and did not represent a public health concern. Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.

2002 Laboratory Testing Results for Minneapolis Water

Before the Minneapolis Water Works can deliver water to your home, it must first be thoroughly tested in certified laboratories that can detect trace amounts of contaminants. These test results for last year are shown in the table below.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or human activity. USEPA regulates substances that are potentially harmful to human health and have at least a reasonable possibility of being found in either water sources or finished drinking water. Our water is monitored for these regulated contaminants at one time or another. Some substances are tested frequently: weekly, quarterly, or annually. The levels of some things, however, change little over time, or the chances of detecting them is expected to be low. These contaminants are monitored less than annually. Substances that have been found in previous years' testing are also listed in the table, along with the year that they were found.

Minneapolis water is tested for over 100 different contaminants. Only those detected are listed in the table. Tested substances fall into one of five different categories:

**Microorganisms**, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural operations, and wildlife.

**Inorganic contaminants**, such as salts and metals, which can occur naturally or come from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

**Pesticides and herbicides**, which may come from agriculture, urban stormwater runoff, and residential uses.

**Organic chemicals**, including synthetic and volatile organic chemicals, which are industrial and petroleum process byproducts and can also come from gas stations, urban stormwater runoff, and septic systems.

**Radioactive contaminants**, which can occur naturally or result from oil and gas production and mining activities.

Water testing laboratories have changed dramatically over the past 50 years.



Detected Substance	Units of Measure	MCL	MCLG	Level Found in Mpls. Water	Range of Detections	Typical Source in Drinking Water
Nitrate/Nitrite (as Nitrogen)	ppm	10	10	0.38	—	Erosion of natural deposits; fertilizer runoff; leaching from septic tanks, sewage.
Fluoride	ppm	4.0	4.0	1.06	0.98-1.1	Additive that promotes strong teeth; fertilizer and aluminum factory discharge.
Haloacetic Acids	ppb	60	—	26.81	11.5-54.3	By-product of drinking water disinfection.
Total Trihalomethanes	ppb	80	—	33.76	14.4-80.0	By-product of drinking water chlorination.
Chlorine	ppm	4.0 (MRDL)	4.0 (MRDLG)	3.8	3.8-3.9	Water additive used to control microbes.
Alpha Emitters	pCi/L	15.0	0	0.4	—	Erosion of natural deposits.
Thallium (7/2/99)	ppb	2.0	1.0	0.5	—	Leaching from ore processing sites; electronics, glass and drug factory discharge.
Turbidity	NTU	TT; 1.0 and < 0.3 95% of the time	—	99.5% of samples < 0.3	Highest Reading: 0.34	Soil runoff.
Lead	ppb	90% of samples must be <15 ppb (AL)	—	90% of samples < 5.8	3 out of 50 samples > 15.0	Corrosion of home plumbing systems, erosion of natural deposits.
Copper	ppm	90% of samples must be <1.3 ppm (AL)	—	90% of samples < 0.3	0 out 50 samples > 1.3	Corrosion of home plumbing systems, erosion of natural deposits.
Sodium (7/2/99)	ppm	No USEPA limit set	—	8.3	—	Erosion of natural deposits.
Sulfate (7/2/99)	ppm	No USEPA limit set	—	25.0	—	Erosion of natural deposits.

ppb: parts per billion, or micrograms per liter of water    ppm: parts per million or milligrams per liter of water  
pCi/L: picocuries per liter, a measure of radioactivity    NTU: Nephelometric Turbidity Units    ND: Not Detected

Drinking Water Research

In 1997-98, the Minneapolis Water Works participated in an 18-month, USEPA-mandated sampling and testing program known as the Information Collection Rule. The purpose of this program was to generate data for future regulations. The data obtained is listed to the right. All substances are disinfectant byproducts except for Total Organic Carbon, which is naturally occurring.



Parameter	Average Result	Range Detected
Chloral Hydrate (ppb)	1.4	0.5-1.9
Cyanogen Chloride (ppb)	3.61	1.91-5.33
Haloacetic Acids (ppb)	24	9-45
Total Organic Halogen (ppb)	130	73-215
Total Organic Carbon (ppm)	4.4	3.1-6

What You Need to Know about Drinking Water Regulations

In order to ensure that tap water is safe to drink, the U.S. Environmental Protection Agency (USEPA) prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration regulations establish limits for contaminants in bottled water that must provide the same protection for public health. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline (800-426-4791).

If You Have Special Health Requirements

Some people may be more vulnerable to contaminants found in drinking water than the general population. Immuno-compromised persons, such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants, can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. USEPA/Centers for Disease Control guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants can be obtained by calling the USEPA's Safe Drinking Water Hotline (800-426-4791).

Lead and Drinking Water

Test results show water in the Minneapolis system to be in compliance for lead. You should know that infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, you may wish to have your water tested. Flushing your tap for 30 seconds to two minutes before using the water can substantially reduce lead exposure. Additional information is available from the USEPA's Safe Drinking Water Hotline (800-426-4791).